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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/617,148

07/10/2003

Bruce Gregory Warren

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10/17/2005

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EXAMINER

MEW, KEVIN D

ART UNIT

PAPER NUMBER

2664

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/617,148

Applicant(s)

WARREN ET AL.

Examiner

Kevin Mew

Art Unit

2664

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6</u> . | 6) <input type="checkbox"/> Other: _____ |

Final Action

1. Applicant's Remarks/Arguments filed on 5/25/2005 regarding claims 1, 3-7 have been considered. Claims 1, 3-7 are currently pending and claim 2 has been canceled by the applicant.
2. Acknowledgement is made of the amended claims 1-5 with respect to the claim objections cited in the previous Office Action. The corrections are acceptable and the claim objections to claims 1-5 have been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Coffey (US Publication 2002/0044561) in view of Black et al. (USP 6,614,796).

Regarding claim 1, Coffey discloses a Fibre Channel Arbitrated Loop interconnect system comprising:

a first port (output of Disk 0 of Cross-Point Switch CPS, see paragraph 0095),
a second port (output of Disk 1 of Cross-Point Switch CPS, see entire paragraph 0095),
said first and second ports including port logic to monitor Open (OPN) arbitrated loop primitives (each loop port arbitrates for access to the loop by performing loop initialization,

assigning Loop Physical Address AL_PA, providing notification that the configuration may have changed, and transmitting Arbitrate (ARBX) Primitive signal to the next node in the loop and monitoring OPN primitives, see paragraphs 0064, 0065, 0068),

a crossbar switch coupled to said first and second ports (Disk 0 is connected to CPS input A and Disk 1 is connected to CPS input B, see paragraph 0095),

a route determination apparatus (the combined system of FC-Analysers and SES Processor is now considered to be equated to the route determination apparatus) including a routing table comprised of Arbitrated Loop Physical Addresses (ALPAs) (FC-Analyser comprises a memory for storing source and destination addresses, Fig. 6), the route determination apparatus separate from the ports and directly coupled to each port and the crossbar switch (FC-Analysers and SES Processor are separate from the first port Disk 0 and second port Disk 1 of the crossbar switch CPS, and directly coupled to Disk 0 port and Disk 1 port through the ESI/SPI 52/54 buses and to the crossbar switch through via lines 32, 34 and 36, see paragraphs 0084, 0098, 0100) through signaling paths (ESI/SPI buses, elements 52, 54, Fig. 5), the route determination apparatus for programming the crossbar switch to establish direct paths between the ports in the crossbar switch (a selection is taken place to uses OPN ordered sets to open a point-to-point connection between the originator port and the destination port, see paragraph 0068),

wherein the crossbar switch creates the direct paths (CPS makes connection between ports, see entire paragraph 0104, lines 12-14) between the ports based on the OPN arbitrated loop primitives (based on the OPN primitive, see paragraph 0068), and

wherein priority for each port is independent of the ALPAs (any loop port is capable of starting loop initialization regardless of the ALPAs, paragraph 0064).

Coffey does not explicitly show a routing table comprising the associated ports of the ALPAs.

However, Black discloses a FCAL switch wherein the routing table comprises ALPAs and their associated ports (col. 8, lines 41-67, col. 9, lines 1-24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the FC-AL apparatus of Coffey with the teaching of Black about looking up the associated ports of ALPAs in a routing table such that a routing table comprises the associated ports of the ALPAs as well. The motivation to do so is to use the destination address in the OPN primitive as a search key to search a routing table to find the ID of a port coupled to the destination node.

Regarding claim 2, Coffey discloses the interconnect system of claim 1 whereby the arbitrated loop primitives that cause the crossbar switch to create paths between ports includes one or more of the following: ARB, OPN and CLS (see paragraphs 0068 and 0063).

Regarding claim 3, Coffey discloses a system for interconnecting Fibre Channel Arbitrated Loop devices comprising:

- a first Arbitrated Loop containing one or more Fibre Channel arbitrated loop devices (Loop A contains Disk 0, see Fig. 1),
- a second Arbitrated Loop Device (Loop B contains Disk 1; see Fig. 1),

a Fibre Channel Arbitrated Loop interconnect system (a fiber channel arbitrated loop interconnect system, see entire paragraph 0030 and Fig. 1), the interconnect system including:

a first port containing port logic coupled to the first Arbitrated Loop (each loop port on the loop is capable of starting loop initialization by entering the initializing state and transmitting one of the Loop Initialization Primitive LIP sequences, see paragraph 0064, lines 7-9),

a second port containing port logic coupled to the second Arbitrated Loop (each loop port on the loop is capable of starting loop initialization by entering the initializing state and transmitting one of the Loop Initialization Primitive LIP sequences, see paragraph 0064, lines 7-9),

the said route determination apparatus separate from the ports and directly coupled to each port through separate signaling paths for selecting a direct route between ports (FC-Analysers and SES Processor are separate from the first port Disk 0 and second port Disk 1 of the crossbar switch CPS, and directly coupled to Disk 0 port and Disk 1 port through the ESI/SPI 52/54 buses and to the crossbar switch through via lines 32, 34 and 36, see paragraphs 0084, 0098, 0100), based on received Fibre Channel Arbitrated Loop primitives from the ports (each loop port arbitrates for access to the loop by performing loop initialization, assigning Loop Physical Address AL_PA, providing notification that the configuration may have changed, and transmitting Arbitrate (ARBX) Primitive signal to the next node in the loop, see entire paragraphs 0064 and 0065) and including a routing table containing Arbitrated Loop Physical Addresses (ALPAs) a route determination apparatus (the combined system of FC-Analysers and SES Processor is now considered to be equated to the route determination apparatus) including a

routing table comprised of Arbitrated Loop Physical Addresses (ALPAs) (FC-Analyser comprises a memory for storing source and destination addresses, Fig. 6),

a crossbar switch (CPS is identified as a matrix of switched connected by signal lines in the center of Fig. 5) directly coupled to the first and second ports and to the route determination apparatus (CPS is directly coupled to Disk 0 port and Disk 1 port, and to FC-AL Analyser and SES processor via lines 32, 34, 36, see paragraph 0098 and Fig. 5) through separate signaling paths (via ESI/SPI buses, elements 52, 54, Fig. 5) for switching frames between ports under control of the route determination apparatus (each loop is initialized with a series of loop initialization frames to be transmitted between ports, see paragraphs 0064 and 0056 and Fig. 1), wherein Fibre Channel frames are transferred between a device on the first Arbitrated Loop and the second Arbitrated Loop Device (see paragraph 0031), and

wherein priority for each port is independent of the ALPAs (any loop port is capable of starting loop initialization regardless of the ALPAs, paragraph 0064).

Coffey does not explicitly show a routing table comprising the associated ports of the ALPAs.

However, Black discloses a FCAL switch wherein the routing table comprises ALPAs and their associated ports (col. 8, lines 41-67, col. 9, lines 1-24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the FC-AL apparatus of Coffey with the teaching of Black about looking up the associated ports of ALPAs in a routing table such that a routing table comprises the associated ports of the ALPAs as well. The motivation to do so is to use the destination address in the OPN primitive as a search key to search a routing table to find the ID of a port coupled to the destination node.

Regarding claim 4, Coffey discloses the interconnect system of claim 3 wherein the Arbitrated Loop primitives that cause the crossbar switch to create paths between ports includes one or more of the following: Arbitrate (ARB), Open (OPN) and Close CLS (see paragraphs 0068 and 0063).

Regarding claim 5, the combined system of Coffey and Black discloses all the aspects of the claimed invention set forth in the rejection of claim 3 above, except fail to explicitly show the interconnect system of claim 3 including a R_RDY counter to count R_RDY'S sent by the originating Fibre Channel Arbitrated Loop device before the OPN response is received by the originating Fibre Channel Arbitrated Loop Device. However, Coffey discloses a R_RDY primitive indicates that an interface buffer is available for receiving frames continuously until something causes the current state to change (see paragraph 0055, lines 15-20). Coffery further discloses is the OPN primitive is used for opening the connection between the transmitter port and the receiver port (see entire paragraph 0068). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of using the R_RDY primitive with the teaching of using the OPN primitive such that the value of the R_RDY primitive will be counted to indicate in the event that the receiver is ready to receive data frames before the originator will receive any opening connection response from the receiver. The motivation to do so is to avoid consuming resources to open connection between two ports unnecessary when the receiver is not yet ready to receive further data frames from the originator.

Regarding claim 6, Coffey discloses the interconnect system of claim 3 wherein the second Arbitrated Loop device is on the first port (Loop B is coupled to the output of Disk 0, see Fig. 1).

Regarding claim 7, Coffey discloses the interconnect system of claim 3 wherein the second Arbitrated Loop device is on the second port (Loop B is coupled to the output of Disk 1, see Fig. 1).

Response to Arguments

4. Applicant's arguments filed on 5/25/2005 have been fully considered but they are not persuasive.

In response to applicant's argument that Coffey fails to teach or suggest the limitation in amended claim 1 that recites "wherein the crossbar switch creates then direct paths between the port based on the OPN arbitrated loop primitives," applicant's attention is directed to paragraph [0068] of Coffey disclosing that once a loop port has won arbitration in a FC-AL loop, a selection is taken place to uses OPN ordered sets to open a point-to-point connection between the originator port and the destination port. Thus, it is clear that this part of the Coffey disclosure reads on this limitation cited in claim 1.

In response to applicant's argument that Coffey fails to teach or suggest the limitation in amended claim 1 that recites "a route determination apparatus including a routing table comprised of Arbitrated Loop Physical Addresses (ALPAs) and their associated ports, the route determination apparatus separate from the ports and directly coupled to each port and the

crossbar switch,” applicant’s attention is directed to Figs. 5 and 6 of the Coffey reference that the combined system of FC-Analysers and SES Processor is now considered to be equated to the route determination apparatus of the present application. This combined system are clearly shown to be separate from the first port Disk 0 and second port Disk 1 of the crossbar switch CPS (CPS is identified as a matrix of switched connected by signal lines in the center of Fig. 5), but directly coupled to Disk 0 port and Disk 1 port through the ESI/SPI 52/54 buses (paragraph 0098) and to the crossbar switch through via lines 32, 34 and 36 (paragraphs 0084, 0100). Furthermore, it is recognized by the examiner that the FC-AL Analyser in Coffey, which is the route determination apparatus, comprises a memory for storing source and destination addresses (a routing table, Fig. 6 and paragraph 0121). Although Coffey does not explicitly show the routing table comprises the associated ports of the ALPAs, the Black reference has remedied this shortcoming by disclosing a FCAL switch wherein the routing table comprises both ALPAs and their associated ports (col. 8, lines 41-67, col. 9, lines 1-24).

In light of the aforementioned reasoning, claims 1, 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffey (US Publication 2002/00444561) in view of Black et al. (USP 6,614,796).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure with respect to method and apparatus for switching fiber channel arbitrated loop systems.

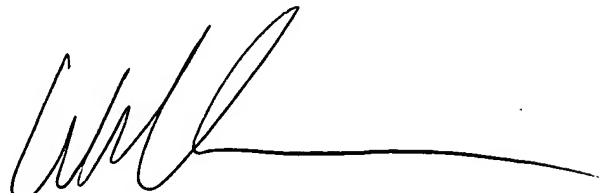
US Patent 6,754,210 to Ofek

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KDM
Art Unit 2664



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ASSISTANT PATENT EXAMINER